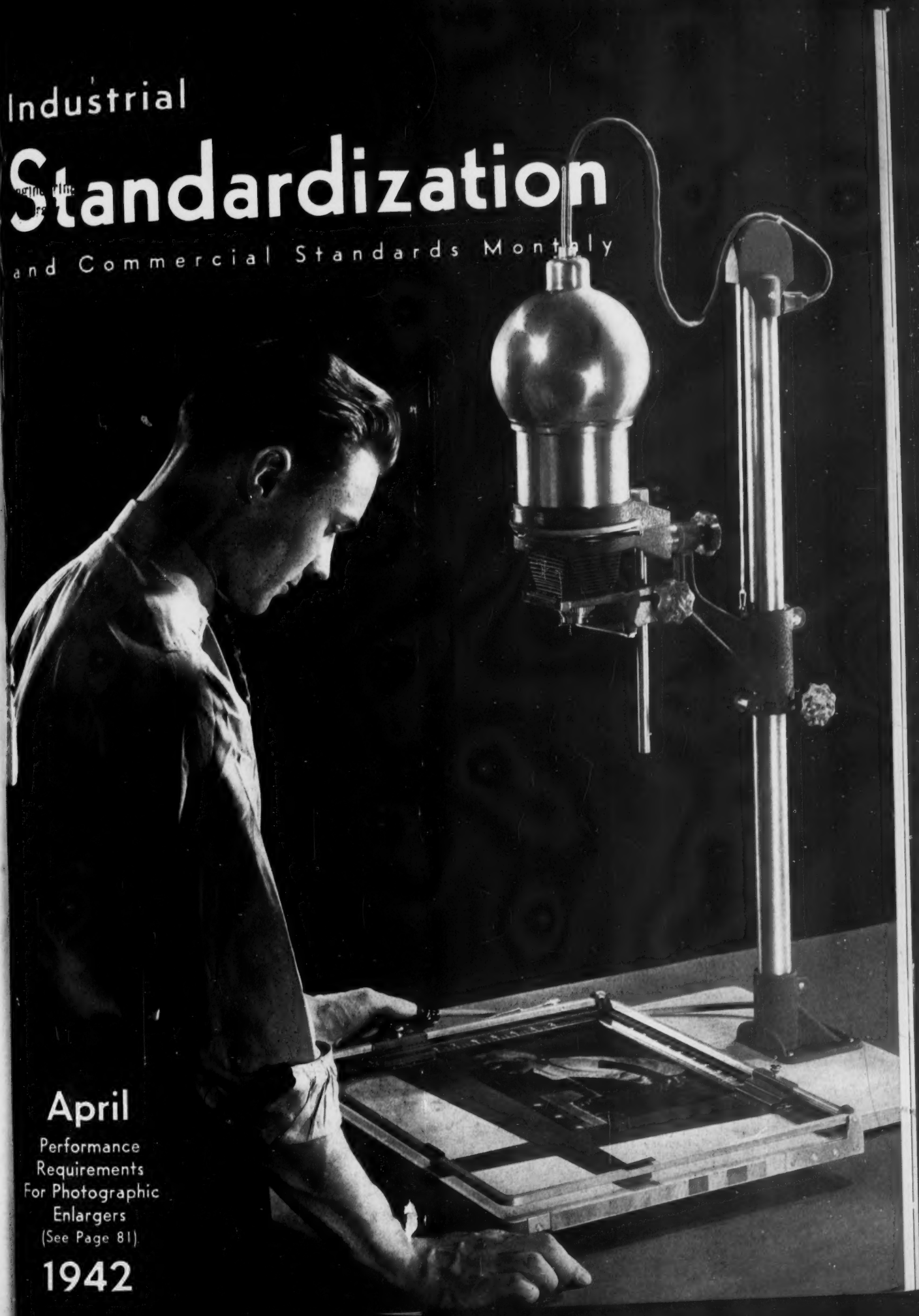
Industrial Standardization

and Commercial Standards Monthly



April

Performance Requirements For Photographic Enlargers

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1942

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And Commercial Standards Monthly

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RUTH E. MASON, Editor

Our Front Cover: Using a Photographic Enlarger. Courtesy Eastman Kodak Company.

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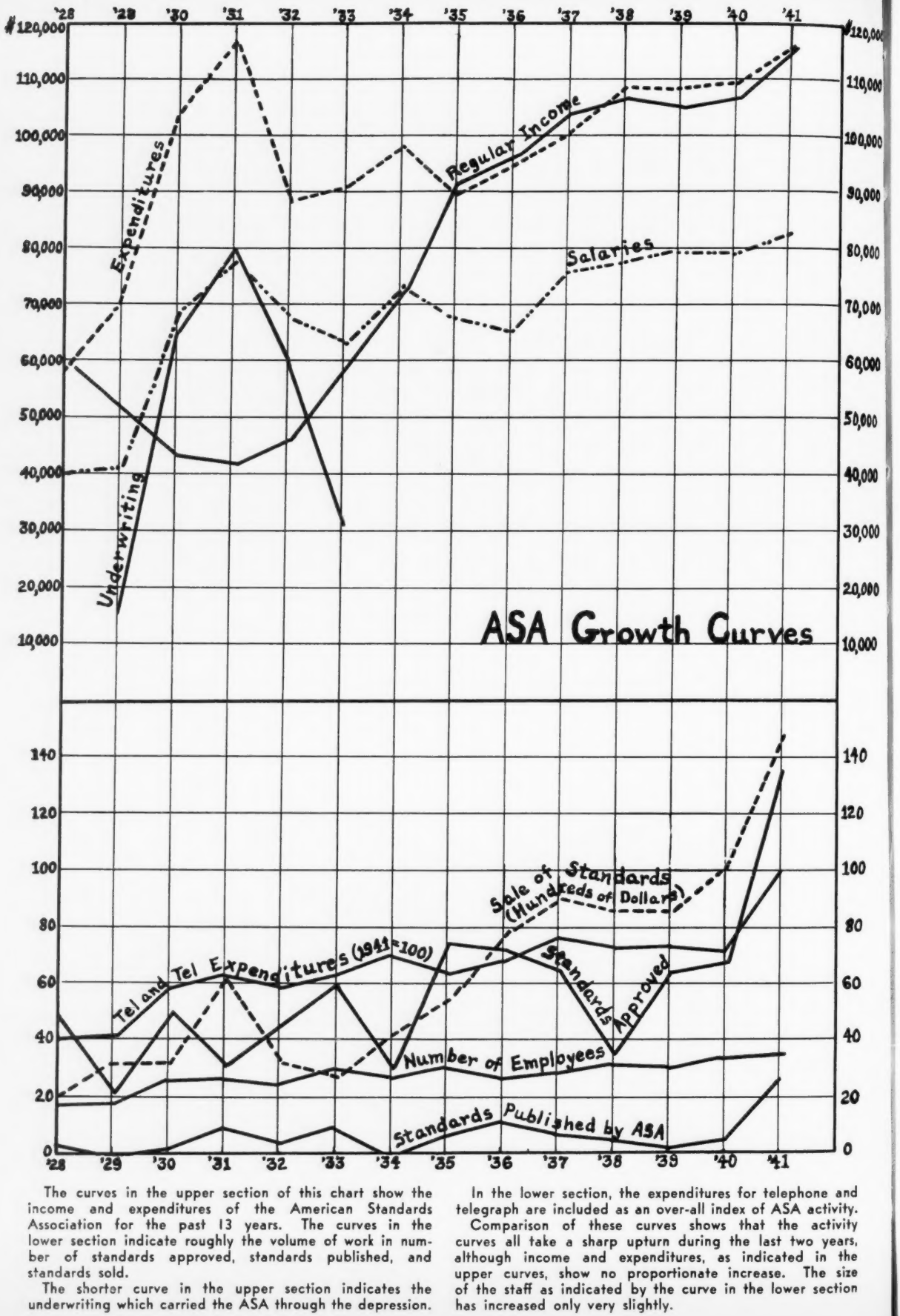

The curves in the upper section of this chart show the income and expenditures of the American Standards Association for the past 13 years. The curves in the lower section indicate roughly the volume of work in number of standards approved, standards published, and standards sold.

The shorter curve in the upper section indicates the underwriting which carried the ASA through the depression.

In the lower section, the expenditures for telephone and telegraph are included as an over-all index of ASA activity.

Comparison of these curves shows that the activity curves all take a sharp upturn during the last two years, although income and expenditures, as indicated in the upper curves, show no proportionate increase. The size of the staff as indicated by the curve in the lower section has increased only very slightly.

Courtesy Eastman Kodak Co.

by Oscar W. Richards

Chairman, Subcommittee 7 on Printing, Projection and Special Equipment of ASA Committee Z38 on Photography

Performance Requirements For Photographic Enlargers

Committee asks all interested to send in comments and criticisms on proposed standards

PROJECTION printers, perhaps better known as enlargers, vary from near-toys to precision instruments, yet certain basic requirements apply to all types. Now, with the publication of a Proposed American Standard and a Proposed American Recommended Practice for Photographic Projection Printing Machines, these basic requirements have been agreed upon, and compiled and published for a period of trial and criticism. Although these proposed standards apply to enlargers for both amateur and professional use, they are not to be applied to motion picture projection printers, the special instruments used in photogrammetry, or to very inexpensive enlargers.

The proposed American Standard (Z38.7.6) sets down general principles, defining magnification as linear magnification and stating that enlargers of a nominal size must be big enough to take roll film, film packs, or sheet film of the largest size for which it is advertised.

The proposed American Recommended Practice

(Z38.7.7) is designed to set reasonable standards of excellence for photographic projection printing machines.

The first section of this proposed standard presents a uniform practice which may be used by all qualified persons in measuring illumination and the evenness of illumination. It provides that the illumination on any part of the image field with any negative mask size and lens combination should not be less than 65 per cent of the maximum illumination when measured under the conditions defined.

While it is well known that in using enlarging equipment the film holder and the paper support must be at right angles to the optic axis, it has not been clearly understood how precisely they should be aligned to give satisfactory results. A great deal of work was necessary on the part of experts to answer this question. The final results of the research on the subject were described by A. W. Tyler, of the Development Department, Eastman Kodak Company in an article "Easel and Negative Tilting Tolerance for Enlargers," *Photo Technique*, August, 1941.

Three American Standards and six proposed standards for photographic equipment have been completed by the ASA Sectional Committee on Photography (Z38) in addition to the two proposed standards described in this article.

The approved standards are:

American Standard Dimensions for Film Pack Tabs and Films (Z38.1.1-1941)
American Standard Dimensions for Film Pack Cases (Z38.1.2-1941)
American Standard Dimensions for 70-mm Perforated (and Unperforated) Film for Other Than Motion Picture Purposes (Z38.1.3-1941)

The proposed standards are:

Method for Determining Speeds of Sensitive Materials (Z38.2.1)
Printing Equipment (Contact Printing Machines, Printing Frames and Masks) (Z38.7.1);
Projection Equipment (Film Strip Projectors, Viewing Devices for 35-mm Film and Reading Devices for Microfilm) (Z38.7.2)
Lantern Slide Projectors (exclusive of Microfilm Readers) (Z38.7.3)
Opaque Projectors for Written or Printed Matter and Pictures (Z38.7.4)
Testing Printing and Projection Equipment (Z38.7.5)

These standards and proposed standards, as well as the two new proposed standards for photographic projection printing machines described by Mr. Richards, are ten cents per copy from the American Standards Association.

The proposed American Recommended Practice states that if the enlarger is equipped with an attached easel the paper support and the negative support should be perpendicular to the lens axis as prescribed in specified formulas.

Enlargers are used with so many diverse forms of material and depend upon such different types of lighting and optical systems that it is difficult to set up quantitative limits for heat. Consequently it seemed better to the committee not to specify quantitative limits for heat, but instead to provide that "when the enlarger is operated in the manner recommended by the manufacturer the negative should not be damaged by heat." Damage, it is understood, would be any distortion by the negative material affecting the print. The clause for protecting the manufacturer is necessary because amateurs sometimes use equipment under conditions which depart from and in no way represent those for which the equipment was designed.

Lens Quality Criteria in Process

Detailed criteria for lens quality are not yet available despite the fact that two subcommittees are working on the problem. It was possible, however, to formulate a tolerance for color work, limiting lateral color. The basis for this limitation is the sensitivity of the eye, and the lateral color limits specified are just under those which will be noticeable by the normal eye under the usual conditions at which enlargements are examined. Lenses may be tested for practical purposes by means of commercially available filters whose transmissions are stated in the standard.

Another recommendation of the proposed standard restricts enlargers sold without lenses to a half-angle covering power of not more than 25 degrees to attain advertised magnification. This was included in order to benefit both the user and the manufacturer by avoiding unreasonable demands. This provision makes it possible to produce the maximum quality for the least price, for those who do not require an unusual design. It merely places the responsibility for purchasing the type of equipment designed for special needs on the user who requires unusual equipment.

Equipment to Be Light-Tight

The remaining provisions of the recommendation, covering light control, negative carrier, and interior finish, are well recognized practice. They include requirements that the equipment should be sufficiently light-tight so that light escaping from it will not fog bromide paper during normal handling, should be operated without harmful vibration, should have a negative carrier which does not scratch or cause physical damage to the negative, and the interior should be finished to minimize the reflection of light. The question,

of course, arises in connection with these requirements: What is "normal handling?"

If an enlarger is to be made completely light-tight so that bromide paper can be exposed to it for an indefinite time, it will unduly increase the cost of the instrument. On the other hand, if the instrument leaks enough light to prevent an operator with reasonable ability from making an enlargement without fogging it, the instrument is unsatisfactory. The handling time that would be normal for the extremely slow, deliberate worker would be considered unduly lengthy by the rapid worker. Our committee believes that photographers may agree on reasonable limits for "normal handling," limits which would obtain sufficient excellence for the purpose but yet would save the user the unnecessary cost of refinement beyond that required.

One problem which the committee faced and which cannot yet be solved is that of classifying enlargers in accordance with whether they have condensing lenses, or depend on diffusion, and whether they have sharp filament sources or gas discharge light sources. A subcommittee has been set up to work on this problem. Our committee is awaiting a report before attempting to include material on these classification questions.

The Proposed American Standard and the Proposed American Recommended Practice are subject to one year's trial and criticism after which they will both be reviewed for approval as American Standards. They are available from the American Standards Association at 10 cents per copy. All those concerned or interested are invited to test the provisions of the proposed standards and send in comments to the chairman of the committee, Dr. Oscar W. Richards, 19 Doat Street, Buffalo, New York, or to the American Standards Association. Suggestions for additional recommendations will be especially welcome.

The value of the standards will depend to a very large extent on the cooperation of all interested. Even after considerable care and long development of a standard, no single committee can foresee all of the difficulties or desirable features to incorporate in a standard. The committee and its consultants have done their best. They offer the results for your consideration and look forward to your assistance toward improving the standards at the end of the year when they will be reconsidered for final adoption.

WPB Asks Railroads To Standardize Box Cars

To expedite production of freight cars vitally needed for transportation of war supplies, the transportation equipment branch of WPB has asked all car builders to standardize and pool car designs.

In a letter to manufacturers, Andrew Stevenson, branch chief, said that "all orders for box, hopper, gondola, and flat cars during the emergency should be limited to the types and designs" set forth in a study made by the car construction committee of the Association of American Railroads. As reported in INDUSTRIAL STANDARDIZATION, February, these types and designs comprise three box cars, one auto box car, two hopper cars, four gondola cars, and three flat cars.

The standardized designs will eliminate variations in height, width, and length of freight cars used on various railroads. A general speed-up of production will result through:

1. Elimination of much of the time required by manufacturers to shift from one design to another, thus freeing more facilities for war work. (It has been estimated that three to seven days are lost whenever a plant makes such a shift.)

2. Reduction of the number of sizes and shapes to be rolled by steel mills, thus making possible faster deliveries and at the same time increasing the availability of steel production for war goods.

Car builders were asked to exchange drawings and patterns in order to expedite the standardization program, and were advised that the transportation equipment branch would recommend steel allocations only for the construction of cars meeting the AAR designs and specifications.

WPB Asks for Changes In Box Specifications

The Containers Branch of the War Production Board has requested manufacturers of folding and set-up boxes to revise specifications in order to reduce consumption of paper board. The requested revisions include reductions in density and finish in the box board used in various types of boxes, and standardization in design and elimination of some sizes. The suggested changes in specifications relate particularly to boxes for baked goods, cereals, confectionery, cosmetics, crackers, dairy products, hardware products, medicinal products, retailers' boxes, soap, sporting goods, textile goods, tobacco and related products, and toys.

Government Requires American Standards In Accident-Prevention Courses

As one phase of its contribution towards industry's increased war-production effort, the American Standards Association has just completed publication of a selected group of American Safety Standards. These standards are to be used as required material in training courses for industrial safety engineers sponsored by the U. S. Office of Education and the U. S. Department of Labor.

The demand for greater and faster production of war materials is bringing industry serious problems of accident-prevention. Many plants are undertaking new and unfamiliar tasks, and thousands of new workers are taking over jobs and handling machines on which they have had little or no experience. Under these conditions, lost time, spoiled material, and human suffering will exact an ever-increasing toll of production unless preventive measures are taken.

Safety leaders have for some time been concerned over this increasing loss in production-time and in man-power. "The accident situation in many war industries already may be regarded as grave, and it is growing worse," Edward R. Granniss, one of the outstanding safety leaders of the country, who is now Associate Manager of the National Bureau for Industrial Protection, declared recently. "With the whole picture still far from complete, it seems likely that more than 21,000 workers were killed on the job in 1941, 75,000 permanently disabled, and 1,700,000 kept from work for from days to months because of work accidents. The man-hours lost might have built 30 battleships."

Organize Safety Engineering Courses

To meet the problem, industrial safety engineering courses have been organized under the supervision of the U. S. Department of Labor and the U. S. Office of Education. Students for the courses are recruited from industry itself, and the course of training is planned to make it possible for industry to use to the greatest advantage the techniques which already have proved effective in preventing industrial accidents. By February 15, 1942, 66 colleges and universities in 27 states were conducting the classes approved by the Department of Labor and the Office of Education, with an authorized total enrollment of 15,167 persons. It is estimated that by September, 1942, approximately 25,000 persons will have received this training.

The course calls for 64 hours of lectures and recitations and 32 hours of plant visits and problem work, a total of 96 hours, in addition to about 32 hours of outside study. The outline can be modified to meet local requirements, but this is considered the minimum amount of instruction desirable, it is explained.

Select Eight Standards

Eight American Safety Standards have been selected by the Department of Labor and the Office of Education as required material in the classes. They were chosen with other required material in mind to present a well-rounded and comprehensive picture of industrial safety requirements. The eight American Standards which have been published by the ASA in a uniform format for the use of the classes are:

- Method of Compiling Industrial Injury Rates (Z16.1-1937)
- Safety Code for Construction, Care and Use of Ladders (A14-1935)
- Safety Code for Industrial Sanitation in Manufacturing Establishments (Z4.1-1935)
- Specifications for Accident Prevention Signs (Z35.1-1941)
- Safety Code for the Use, Care, and Protection of Abrasive Wheels (B7-1935)
- Safety Code for Mechanical Power Transmission Apparatus (B15-1927)
- Safety Code for Floor and Wall Openings (A12-1932)
- Safety Code for Protection of Heads and Eyes of Industrial Workers (Z2-1938)

The Safety Code for the Use, Care, and Protection of Abrasive Wheels was made available to the ASA for this purpose through the courtesy of the Grinding Wheel Manufacturers Association. Permission to reprint the Safety Code for Mechanical Power Transmission Apparatus and the Safety Code for Protection of Heads and Eyes of Industrial Workers in the uniform format was granted by the American Society of Mechanical Engineers, and by the National Bureau of Standards, the original publishers of the standards.

Lists All Safety Standards

In addition to the standards, the volume contains a special introduction describing and listing all American Safety Standards.

The packet of eight standards, in a special binder, is being sold to the students at $1.25 per packet.

New Gaging Standard Supplements American Standard for Screw Threads

A NEW American Standard, Screw Thread Gages and Gaging (B1.2-1941), developed by Subcommittee 5 on Screw Thread Gages and Inspection of the ASA Committee on Screw Threads, has just been approved by the American Standards Association, and copies are now available. Work of the ASA committee on Screw Threads is going forward under the sponsorship of the American Society of Mechanical Engineers and the Society of Automotive Engineers. George S. Case, president of the Lamson & Sessions Company, Cleveland, is chairman of Subcommittee 5, and H. W. Bearce, chief of the Division of Weights and Measures, National Bureau of Standards, is secretary. A subgroup of this subcommittee under the chairmanship of Colonel H. B. Hambleton, Ordnance Department, War Department, prepared the preliminary reports leading up to the subcommittee's proposal.

Recommends How to Check Product

The new standard serves as a supplementary document to the American Standard for Screw Threads (B1.1-1935)—which covers the nominal dimensions, tolerances, and limits for coarse and fine threads and for threads of the 8-, 12-, and 16-pitch series—and makes recommendations on how to check product threaded to the American (National) Form as given in American Standard B1.1-1935. It covers specifications for working gages, inspection gages, and setting plugs, and gaging practice.

The class of gage accuracy which should be used in each case for Go and Not Go thread plug and ring gages, and for setting plugs, is indicated in a table. Additional tables give the tolerances and limiting dimensions of the thread plug and ring for American Standard coarse or fine threads, and for work of Class 1, 2, 3, or 4. A similar set of tables gives the tolerances on thread plug and ring gages and setting plugs for checking threads having the American National Form of thread, but special pitches.

What the Standard Contains

The new standard contains a list of definitions concerning screw threads; the specifications of the American National Form of Thread; and a section entitled Use and Type of Gages. The latter is divided into a subsection on Fundamentals, which among other things, specifies 68 F (20 C) as the standard reference temperature for gages. The other subsection, entitled Specifications for Gages, is followed immediately by the tabular data mentioned before. The subcommittee that developed the new standard has given special consideration to keeping the specifications for gaging threaded products as flexible as possible. The reason for this is that sound gaging practice depends, among other things, on the nature of the product to be checked. Therefore, the standard leaves certain matters to agreement between the supplier and the user of the threaded products. For example, while normally a Not Go thread gage shall be permitted to enter or be entered only a specified distance without shake or play, this practice may have to be modified in special cases, where the number of threads in the tapped hole is small, for instance, as in exceptionally thin material.

A similar concession is made in regard to the gaging of general purpose (commercial) nuts. According to the standard, the crest of the Not Go thread plug shall normally be truncated to such extent that the width of the flat is $\frac{1}{4}$ pitch. However, where the gaging of commercial ("general purpose") nuts is concerned, the standard recognizes that the manufacturer and the user may have to agree on a modification of this practice.

Is Flexible on Tolerances

The new standard is flexible also in regard to the direction of tolerances on gages. The limits specified for screw threads represent the extreme dimensions of an acceptable product. Therefore, in principle the limits specified for the gages should lie inside the limits specified for the product or conversely, the tolerance on the product should take care of all variations that may occur in the size of the threading tools and the gages. However, in the zone close to the Not Go limit of the product (minimum metal condition) small differences in the size of the Not Go gage may easily lead to controversy as to whether a part is inside or outside its tolerance. To avoid such a controversy, the standard specifies that the tolerances on the pitch diameter of all Not Go gages used by the manufacturer for final inspection of his own product and by the user of nuts, for inspection of purchased product.

may be outside the product limits if specifically authorized by the user.

To avoid confusion, it should be noted that although the new standard and the recently published Handbook 28, Screw Thread Standards for Federal Services, published by the National Bureau of Standards, agree with each other, they are not used by the Gage Section of the Ordnance Department of the War Department.

The subgroup of Subcommittee 5, in preparing its reports, started with the gage specifications given in the 1933 report of the National Screw Thread Commission, which were modified to make them more flexible. In the meantime, the Interdepartmental Screw Thread Committee, composed of representatives of the Departments of War, Navy and Commerce, was preparing Handbook 28, Screw Thread Standards for Federal Services. This handbook, which was a revision of the 1940 edition of Handbook H25, was published by the National Bureau of Standards in 1942. The American Standards Association has four liaison representatives on the Interdepartmental Screw Thread Committee, and a close contact was maintained between the work on screw thread gaging in ASA Committee B1, and in the ISTC. As a result, the specifications now given in the American Standard B1.2-1941 and the NBS Handbook H28 are in agreement with each other. They differ, however, of course, from those given in the 1933 NSTC Report.

The use of Handbook H28 is intended to be mandatory in the Departments of War, Navy, and Commerce, "except where a need for deviation therefrom is shown." The Gage Section of the Ordnance Department, War Department, has not adopted the specifications for screw thread gages and gaging given in Handbook H28, but has continued to adhere to the specifications given in the 1933 NSTC Report. With a view to the present importance of contracts given to industry by the Ordnance Department, this fact should be called to the attention of those accepting such contracts.

The new standard is available from the American Standards Association at 60 cents per copy.

Forty-Year Anniversary For ASTM

Forty years ago, March 21, 1902, to be exact, the first legal step was taken to organize the American Society for Testing Materials. On that day seven men petitioned the Judges of the Court of Common Pleas in Philadelphia that they be incorporated as the "American Society for Testing Materials" stating that "the corporation is formed for the Promotion of Knowledge of the Materials of Engineering and the Standardization of Specifications and the Methods of Testing." They further indicated that "the said corporation is to exist perpetually."

The seven men were Henry Marion Howe, Charles Benjamin Dudley, Edgar Marburg, Robert W. Lesley, Mansfield Merriman, Albert Ladd Colby, and William R. Webster.

On June 4, 1902, Samuel W. Pennypacker, President Judge, after stating that the proposed corporation appeared lawful and not injurious to the community "did order and direct that the said charter be and is approved."

This was not the first appearance of the organization, however, since it had existed for some four years as an American Committee of the International Association for Testing Materials. The desirability of intensive work on specifications in the United States, and lukewarm interest abroad, led to the legal incorporation of the American society.

As expressed by the ASTM itself, "whether Walter Pitkin with his 'Life Begins at Forty' is right or wrong, there's a great deal of life left in the old 'gal' yet."

The American Standards Association extends its congratulations to the ASTM, one of ASA's earliest and most active Member-Bodies, on its 40 years of service to American industry.

Sizes, Ratings, and Installation In Manual for Heating Systems

Recommended sizes, Btu ratings, and suggested installation procedure are included in a Standard Code Application Manual just issued by the National Warm Air Heating and Air Conditioning Association. The purpose of the recommendations and tables is to simplify the selection of the equipment in the design of gravity warm-air heating systems. The Manual includes a short-cut method to estimate heat losses. Copies have been distributed to Federal Housing agencies and the National Bureau of Standards, and other agencies concerned with standardization and the elimination of waste.

The "What" and "Why" Of the New American Standard Letter Symbols for Hydraulics

by J. C. Stevens[1]

Chairman, Subcommittee 2 on Hydraulics of ASA Sectional Committee on Letter Symbols and Abbreviations for Science and Engineering

THE recent adoption by the American Standards Association of a revised set of Letter Symbols for Hydraulics marks the culmination of six and one-half years of endeavor to harmonize the divergent ideas of the "two and seventy jarring Sects."

An earlier set of symbols was adopted by the ASA and published in 1929. That list was good but too brief to cover the field adequately. It was doubtless as complete as could be agreed upon at that time.

The symbols adopted in 1929 have been retained in the 1941 list in so far as it was possible to secure agreements thereon.

Why a Standard List?

It is well to pause right here and get properly oriented to the make-up and purpose of a list of standard symbols:

1. A letter symbol is a single character, with subscript or superscript if required, to designate a physical magnitude.
2. The same symbol should be used for the same physical magnitude regardless of the units employed and regardless of the special values occurring for different states, points, parts, or times. These latter are designated by subscripts or superscripts.

The committee early adopted a rule to recognize current usage, but of course not to the exclusion of common sense. It has offered one symbol only, a preferred one, for each magnitude treated. The author is privileged to use alternate symbols if confusion would otherwise result. Only a few of the more common subscripts are indicated; the author will elaborate on them as he pleases. If he departs from or adds to the standard list he should clarify his text accordingly.

The prime objective in adopting a set of standard symbols for any science is to save the reader brain fag. One of the present hurdles in digesting a technical paper is to commit to memory the author's list of symbols. Many authors from habit or stubbornness still stick to their own pet symbols regardless of standards. The suggestion is offered that such authors had better conform hereafter if they want their papers read.

The 1941 List

Here are a few of the more important changes made in the 1929 list and some whys.

Present usage prefers y to d for depth, thus avoiding confusion with diameter and the differential sign. Width of the surface of a stream has shifted from B to b, and of a weir crest from

Revision adds new letter symbols to standard list and makes changes in earlier standard to recognize new practices

[1] Consulting Hydraulic Engineer, Portland, Oregon; representative of the American Society of Civil Engineers on ASA Committee on Letter Symbols and Abbreviations for Science and Engineering (Z10).

Z to b. Coefficients of velocity, contraction, discharge, etc., are now designated by the capital C instead of a lower case c.

Two new and important coefficients have been added. One is C_e, a coefficient by which the velocity head of the mean velocity may be multiplied to obtain the mean energy of a pound of the flowing fluid. The Greek letter α has heretofore been used for this coefficient. Similarly C_m may be applied to the momentum corresponding to the mean velocity to obtain the mean momentum of a pound of the moving fluid. For this coefficient β has frequently been used.

A rather sharp distinction has been drawn between density and specific weight. Our thinking in this regard needs to be corrected. Density, ρ, represents mass per unit volume and specific weight, δ, must be thought of as force per unit volume. The relation $\rho = \delta/g$ thus obtains. Incidentally we found the profession about equally divided between δ and w for specific weight, but the Greeks finally won.

The world still indulges in muddled thinking about *weight* and *mass* because there are two basic systems of units in use, dynamical and gravitational. The former is referred to as the absolute or physical system and the latter as the technical system.

Gravitational Unit vs Dynamical Unit

A dynamical unit of force produces unit acceleration on a unit mass. A gravitational unit of force produces an acceleration equal to that of the earth's gravitational pull on a unit mass. The dynamical unit of mass is constant throughout the universe while the gravitational unit of mass varies with the earth's gravitational field.

The gravitational or technical system of units has been adopted by the engineer, the dynamical system by the physicist. The engineer uses the pound weight as a unit of force and the slug (would we had a more elegant name, for instance "jeep" for gee-pound!) as the unit of mass. Weight is a force measured by scales and balances calibrated by comparing them with the earth's pull on standard masses. Not only does the engineer's pound force vary but his slug also follows him around.

Because of this fog the physicist leaves the engineer to wallow in his confusion and operates mostly in the metric system of dynamical units where the dyne is the unit of force and the gram the unit of mass, an unvarying constant if there ever was one.

The Letter Symbols

Now let's get back to our letters.

Symbol e, the hussy, has had more loves than a geisha girl. In her checkered career she has embraced efficiency, eccentricity, elasticity, specific energy, thickness of steel plate, energy head, and of course her first love the base of the natural logarithms. Any wandering magnitude could always find a welcome at e's house of gaiety.

We gave efficiency back to the Greeks, using η; we dropped energy head altogether as a loose character, and pegged specific energy with H_o. Hereafter she must devote herself to kinematic elasticity, although we know she'll manage somehow to pick up other beaux.

Pressure was a real headache, not as to symbols but as to their meaning. The physicist thinks pressure always has, now does, and forever will mean force per unit area and nothing else. The engineer however has the idea that the weight of water acting on the entire face or base of a

Subcommittee 2 of the ASA Sectional Committee on Letter Symbols and Abbreviations for Science and Engineering (Z10) prepared the new American Standard Letter Symbols for Hydraulics. Members of this subcommittee are:

John C. Stevens, Consulting Hydraulic Engineer, Portland, Oregon, *Chairman*

H. S. Bean, chief, Gas Measuring Instrument Section, National Bureau of Standards

Albert H. Borchardt, assistant vice-president Charge Application Engineering Sales, Worthington Pump and Machinery Corp

O. E. Brownell, sanitary engineer, Minnesota State Department of Health

Calvin V. Davis, Principal Hydraulic Engineer, Tennessee Valley Authority

H. A. Foster, Parsons, Klapp, Brinckerhoff and Douglas

Ivan E. Houk, senior engineer, U.S. Bureau of Reclamation

S. Logan Kerr, manager, Chemical Engineering Division, United Engineers and Constructors, Inc

G. H. Matthes, principal engineer, Mississippi River Commission

F. T. Mavis, head, Department of Mechanics and Hydraulics, State University of Iowa

J. M. Mousson, hydraulic engineer, Safe Harbor Water Power Corporation, Baltimore, Md

M. P. O'Brien, professor of mechanical engineering, University of California

Fred C. Scobey, senior irrigation engineer, U.S. Department of Agriculture, Berkeley, California

Lorenz G. Straub, professor of hydraulics, University of Minnesota

Chilton A. Wright, associate engineer, National Hydraulic Laboratory, National Bureau of Standards

dam or on a gate is a particular kind of force which he calls "pressure" and that force divided by the area is "pressure intensity" and not just "pressure" alone. Since this is an engineering endeavor we had to glorify the engineer, even if he is wrong.

Fluid mechanics has brought us certain dimensionless numbers that we felt had to be recognized. Those listed are: **C,** the Cauchy number; **F,** the Froude number; **R,** the Reynolds number; and **W,** the Weber number. Isn't it fortunate that no two of these famous men's names begins with the same letter? Note also that the names do not have the possessive form.

In order to avoid confusion with the hydraulic radius R, there has been quite a tendency to write Re for the Reynolds number, but that is an abbreviation and not a letter symbol, so we argued its advocates out of it.

We have not yet found a suitable symbol for volume V, and work W, that will distinguish them from mean velocity and weight. The footnote in the published list suggests V_L for volume (we had to swallow hard to accept that one because it violated a rule we had made of no capital letter subscripts) and W_k for work. The writer still feels that his suggestion of using **V** for volume and w for work was best, but some have bowed the knee too long to the god of consistency who wants to reserve bold faced letters for "fundamental concepts" whatever they are.

Aside from the General symbols a special list was adopted for hydraulic structures, another for hydraulic machinery, and also one for hydraulic models. These special sets of symbols are elaborations of the general symbols in specialized fields.

It is interesting to observe that the 1929 list contained 60 symbols (without repetition of meaning) while the 1941 list contains 170. The writer believes this is an index of definite progress toward desirable standardization.

Prentis Is Honored For War Work

Edmund A. Prentis, past-president of the American Standards Association, was awarded the annual Moles award at the annual meeting of the organization February 5. Mr. Prentis, who is a member of the construction firm of Spencer, White and Prentis, was chosen with M. J. Madigan, to receive the award for "outstanding work in the war effort" at "considerable personal sacrifice."

The Moles is an organization of men engaged in tunnel, subway, sewer foundation, marine, and other heavy construction work.

In addition to the American Standard, Letter Symbols for Hydraulics, a new American Standard, Letter Symbols for Mechanics of Solid Bodies (Z10.3-1942), was completed recently by a subcommittee of ASA Sectional Committee Z10. This new standard is a revision of a former standard Z10a-1932.

A revision of the general standard, Abbreviations for Scientific and Engineering Terms (Z10.1-1941), was also completed and published last year.

Other subcommittees are working on new standards and revisions of standards for letter symbols and signs for mathematics, for structural analysis, for heat and thermodynamics, for photometry, for aeronautical symbols, for electric and magnetic quantities, for electric and magnetic qualities, for radio, for physics.

The work of the sectional committee is carried on under the leadership of the American Association for the Advancement of Science, American Institute of Electrical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, and the Society for the Promotion of Engineering Education. H. M. Turner, representing the American Institute of Electrical Engineers and the Institute of Radio Engineers, is chairman of the sectional committee. S. A. Moss, representing the American Society of Mechanical Engineers, is vice-chairman; and H. W. Samson, alternate representative for NEMA, is secretary.

Copies of the new standards are now available. The American Standard Letter Symbols for Hydraulics (Z10.2-1942) is 35 cents per copy; and the American Standard Letter Symbols for Mechanics of Solid Bodies (Z10.3-1942) is 25 cents per copy.

Plan to Eliminate Flour Brands

A campaign to eliminate inactive flour brands which might reduce the number of brands 75 per cent is being carried out by the Millers' National Federation.

Drainage Fittings Standard Is Most Recent in Piping Series

CAST-IRON screwed drainage fittings have been used in the United States for more than 60 years. Originally introduced to the plumbing trade about the year 1880 by the Durham House Drainage Company of New York, the term "Durham fittings" came to be applied to all fittings of this type. The design is such that the threaded joint between the pipe and fitting provides a continuous passageway without pockets where foreign matter can collect and form obstructions to flow.

These screwed drainage fittings follow the general proportions of other cast-iron screwed fittings except that the shapes and center-to-end dimensions are designed to suit the particular service for which they are intended. Up to the year 1929 manufacturers' patterns for these fittings followed the general design but varied as to center-to-end dimensions. This led to a study by the Manufacturers Standardization Society of the Valve and Fittings Industry, which as a result prepared a Standard Practice covering cast-iron screwed drainage fittings, MSS SP-8. In this Standard Practice the center-to-face dimensions and other general dimensions were made to agree with similar dimensions for pressure type cast-iron screwed fittings.

In order that this type of fitting might be brought into line with other screwed fittings approved as standards by the American Standards Association, and prepared by ASA Sectional Committee B16, Subcommittee 2 of the sectional committee prepared an American Standard based upon MSS SP-8. This has now been approved by the American Standards Association. The standard includes recommendations for marking, material, tolerance, threading, ribs, coatings, two tables of Inspection Limits, and nine tables showing dimensions. A table of dimensions of welded and seamless steel pipe, from American Standard B36.10-1939, is included as an appendix.

The ASA Sectional Committee on Standardization of Pipe Flanges and Fittings, which now has twelve completed standards to its credit, carries on its work under the administrative leadership of the American Society of Mechanical Engineers, the Heating, Piping, and Air Conditioning Contractors National Association, and the Manufacturers Standardization Society of the Valve and Fittings Industry.

Copies of the American Standard, Cast-Iron Screwed Drainage Fittings (B16.12-1942) are available from the American Standards Association, at 45 cents per copy.

ATAE Plans Study Of Consumer Standards

The American Trade Association Executives plans to undertake a research program to study post-war planning, consumer standards, and employee relations, the organization announced recently. W. J. Donald, managing director of the National Electrical Manufacturers Association, is president of the ATAE. He announced that the committees which will undertake the program will confer with government departments and agencies and with schools of business in the development of the program.

One of the most important activities, he announced, will be the attempt to foresee post-war conditions and formulate the trade association's relation to them. The committee in charge of this work has been named the Trade Association Participation in Post-War Planning. It will be headed by Earl Constantine, who is president of the National Association of Hoisery Manufacturers.

The consumer movement and consumer standards and the relation of the trade associations to them will be studied by a committee on Trade Associations and Consumer Standards. David R. Craig, president of the American Retail Federation, Washington, will be chairman.

The question of employee activities is to be analyzed by a committee headed by Frank Rising, general manager of Automotive Parts and Equipment Manufacturers, Inc, Detroit.

Three other committees will undertake cooperative programs with schools of business, engineering, and agriculture. They will analyze mutual interests of these schools and trade associations with a view to providing methods of exchange of information and opinion.

New American Standard Includes Batteries for Hearing-Aids

by George W. Vinal[1]

Chairman, ASA Committee on Dry Cells and Batteries (C18)

SIXTEEN years ago ASA sectional committee C18 was organized under the sponsorship of the National Bureau of Standards for the express purpose of preparing an American Standard for dry cells and batteries. This committee took over the work of several committees previously engaged on battery specifications.

Among these, a committee of the Electrochemical Society, which began work in 1912, deserves credit for initiating standard tests for dry cells. Five years later, under the impetus of war conditions, specifications were drafted by the National Bureau of Standards. The interest of manufacturers was aroused, and at their request a conference met at the Bureau in 1921 and prepared a more formal specification. Still another committee in 1924 formulated standard designations for dry cells and initiated a movement for a more representative and permanent organization to deal with subsequent revisions of the dry cell specifications.

Such is the background of the present sectional committee organized in 1926.

The sectional committee has been active since its organization and has prepared revisions of the specifications which became American Standards in 1928, 1930, 1937, and 1941. The new standard, C18-1941, was approved by the American Standards Association on November 28, 1941, and is being published in Circular No. 435 of the National Bureau of Standards. This circular is now in press.

Reverting to the specifications of 1917, two of the original tests have been continued to the present day without significant change, and it may be of interest, therefore, to compare the early requirements with those of the highest grade cells in the latest specification. Comparative figures are given in Table 1 together with average test results on a number of the better brands of cells. Improved performance of other types and sizes of batteries has been equally as notable.

Table I

Kind of test	*Requirements in 1917*	*Requirements in 1941*	*Average test results in 1941*
Heavy Intermittent	34 hours	100 hours	123 hours
Light Intermittent	140 days	325 days	360 days

Improvement in the art is sufficient reason to revise the specifications periodically but there are other reasons also, such as the development of new types to meet changing conditions and new applications for previously existing types. Since the preceding specification, C18-1937, was published, miniature cells and batteries have been developed for portable radios, radio sondes, and the newer types of vacuum-tube hearing-aid devices.

One of the most difficult situations facing the committee has been the standardization of batteries for hearing aids. The variety of types and kinds of hearing-aid instruments has naturally been reflected in the variety of batteries to be used with them. The development of hearing-aid batteries is still in a state of flux, but the new standard contains recommendations which are put forward with the hope and expectation that

Represents Best Practice for Many Types of Dry Cells and Batteries; Will Be Starting Point for New Developments when War Is Over

[1] National Bureau of Standards, Washington, D.C.

they may serve as a guide in the further development of hearing-aid instruments.

Several types of terminal arrangements for hearing aids and batteries are shown in the specifications. These should cover most of the instruments commercially available.

In particular, one terminal arrangement designated in the specification as XX provides a means of using the same battery with a number of makes of carbon-type instruments which heretofore have required different batteries. General adoption of this terminal would make it possible for users of hearing-aid apparatus to use any of these various makes interchangeably and would therefore be of great advantage to them as well as to others concerned with the manufacture and distribution of these batteries. The action of the sectional committee in this matter received the endorsement of the Council of Physical Therapy of the American Medical Association.

Includes New Size of Cell

A new size of cell, designated as BB, has been included in the standard because it is produced in large quantities for export use in "black-out flashlights" and it is also used in this country for B batteries in portable radios. The five miniature cells which have been added are designated as R, P, N, M, and K.

Much of the radio equipment of the present day is usable to lower B-battery voltages than formerly. This fact is recognized in the new specifications by a decrease in the specified cut-off voltage for B batteries from 17 to 15 volts for each 22½-volt unit (nominal voltage). Another change in the procedure for testing B batteries involves an increase in the test current for all but the smallest sizes. The 5000-ohm test for 22½-volt units, commonly used in the past for all but the largest sizes, is now specified for only the miniature N and P sizes of cells. Twenty-five hundred ohms as an intermediate value is specified for cells of the AA, A, BB, B, and D sizes. A still heavier test is provided also for D-size cells and the larger cells F and G.

Eliminates Continuous Tests

The test of any type of battery which best represents a particular service is that which most nearly duplicates the rate of energy output of the battery when it is in actual use. There is no direct relation between the results of continuous tests and intermittent tests of longer duration. Continuous tests have been eliminated from the specification. Because dry cells as a general commodity have many and varied applications, the tests required of them are rather numerous and some extend over a considerable period of time. It has been the practice of the National Bureau of Standards, therefore, to conduct qualification tests periodically on batteries supplied by manufacturers. Each manufacturer is subsequently informed of the results on his own prod-

ASA Committee Prepares Standard for Dry Cells

The new edition of the American Standard Specifications for Dry Cells and Batteries (C18-1941) was prepared by an ASA Sectional Committee under the sponsorship of the National Bureau of Standards. Members of the committee are:

George W. Vinal, National Bureau of Standards, *Chairman*

C. A. Gillingham, National Carbon Company, Inc, *Secretary*

National Bureau of Standards, *J. Schrodt; George W. Vinal*

American Institute of Electrical Engineers, *W. B. Kouwenhoven*

American Society for the Hard of Hearing, *Douglas Macfarlan*

Association of American Railroads, Engineering Division, Signal Section, *A. B. Himes*

Association of American Railroads, Operating Division, Telephone and Telegraph Section, *C. O. Ellis*

Association of Edison Illuminating Companies, *H. C. Koenig*

Bright Star Battery Company, *F. A. Keller*

Burgess Battery Company, *H. W. Porth; V. G. Reel (alt)*

Electrochemical Society, Inc, *C. C. Rose*

General Dry Batteries, Inc, *C. G. Birdsall*

Institute of Radio Engineers, *H. M. Turner*

National Carbon Co, Inc, *C. A. Gillingham*

National Electrical Manufacturers Association,

National Electrical Wholesalers Association, *H. O. Smith*

Ray-O-Vac Company, *R. E. Ramsey*

Sectional Committee on Acoustical Measurements and Terminology, *Howard A. Carter*

Sectional Committee on Radio, *F. T. Bowditch*

ASA Telephone Group, *E. B. Wheeler*

U.S. Navy Department, Bureau of Ships

U.S. War Department, *Theodore Bishoff; Hartwell F. Stallings (alt)*

Winchester Repeating Arms Co, *John Martinez*

Members-at-Large, *W. B. Kouwenhoven*

Copies of the new standard are now available from the American Standards Association at 10 cents each.

uct and complete information is available for the various branches of the government. The history of these qualification tests since their beginning in 1924 shows commendable progress made by manufacturers in improving their product. The benefits have accrued to the general public in larger measure than is generally realized.

The new specification, C18-1941, represents the dry-cell industry at its best. It covers the first-grade product of the manufacturers and includes all the types of batteries commonly used by the public. Production of dry batteries is large. Census figures indicate a yearly production of hundreds of millions of cells and batteries. This is peacetime production. Demands in war time are likely to be heavier but they are subject to limitations which cannot be fully anticipated now. Shortages of materials and difficulties in manufacturing conditions may also affect the quality and quantity of the product. The sectional committee will consider, if necessary, emergency amendments to the specification, but the new standard should stand as representative of the industry today and as a starting point for new developments when peace is again restored.

Building Codes May Determine Use of Housing Materials

A new Defense Housing Critical List, issued by the Housing Priorities Branch, WPB Division of Industry Operations, supersedes the original list issued September 19, 1941. Only those materials and products included in this list, and only in the limited quantities and for the uses specified in the list, or imposed by a Preference Rating Order, may be procured by the extension of a Preference Rating Order granted for a housing project.

In some cases the list makes the use of materials dependent upon the existence of an "Applicable Code or Regulation." This term is defined as meaning "a code or regulation of a public body having jurisdiction, or a regulation or standard of a housing agency of the Federal Government constructing or aiding the financing of the project." Detailed specifications are included for builders' hardware so as to reduce the use of the more critical metals to a minimum. In addition, to assure heating efficiency and conserve heating materials, the list requires that gas floor furnaces must come within 90 per cent of the output rating determined in accordance with the Commercial Standard for Gas Floor Furnaces. This standard is now before the American Standards Association for approval as American Standard. Gas-fired space heaters must come within 90 per cent of the AGA output rating (American Standard Z21.10-1941), and oil-fired space heaters to 100 per cent of the Commercial Standard for Flue-Connected Oil Burning Space Heaters. Quantity and sizes of roughing in materials are limited to meet the minimum requirements of the "Emergency Plumbing Standards" issued by the Defense Housing Coordinator under date of December 26, 1941.

The Defense Housing Critical List was issued by the Division of Industry Operations of the War Production Board.

American Standard Cause Code Is Called "Invaluable Contribution"

"The difficulty of obtaining accurate factual information as to the causation of accidents due to the pitiably limited sources of information is an unexplainable and inexcusable circumstance in this enlightened day and age. . . .

"I maintain that after more than a quarter of a century of Workmen's Compensation Administration in New York State, which at its inception was expected to stimulate accident prevention, we do not yet have authentic accident statistics of any direct value in safety code making, and as a result the science of accident prevention is effectively hamstrung by reason of the absence of such factual data. . . .

"Credit must be given to H. W. Heinrich of the Travelers Insurance Company, a pioneer advocate of accident cause analysis, and to Max D. Kassoris of the U. S. Bureau of Labor Statistics for their untiring efforts and their invaluable contribution to industrial accident prevention in the development of a comprehensive classification code for accident cause analysis based upon the original 'Heinrich Cause Code' and which has since been sponsored by the American Standards Association."

—William J. Picard, Chairman, Board of Standards and Appeals, New York State Department of Labor.

First Traffic Engineering Handbook Presents Basic Reference Data

THE first Traffic Engineering Handbook ever to be published was issued recently as a joint publication of the Institute of Traffic Engineers and the National Conservation Bureau. It presents basic traffic engineering data as a guide to current best practice and to serve as a reference book for those responsible for solving technical problems of traffic and transportation.

Fourteen nationally known traffic engineers took part in the actual writing of the Handbook, and a canvass of all members of the Institute of Traffic Engineers was made to determine what information should be included.

Sixty-four tables and 149 charts and figures graphically illustrate the 15 chapters and two appendices.

What the Book Includes

Only a review of the information covered in each chapter can give an adequate idea of the scope of the material presented.

Facts concerning motor vehicles, their numbers, physical characteristics, and the extent to which they are being used make up the material included in the first chapter. Motor vehicle registrations are given by states, the age and dimensions of motor vehicles are analyzed, the length of trips and number of passengers are charted, and gasoline and oil consumption in relation to speed is given.

In the second chapter the natural laws of motion as they apply to motor vehicles are presented, and sections cover work and energy, linear motion, centrifugal force, acceleration and deceleration, and friction and skidding characteristics.

There are more than 40,000,000 licensed drivers in the United States today, and Chapter 3 gives facts concerning the age, sex, and physical and mental characteristics of these drivers. Some of the charts included show driver reaction distances, driver eye position in 1936-1940 passenger cars, the driver's visual field, and glare resistance of persons of various ages.

Gives Data on Pedestrian Problems

The pedestrian is assigned a chapter to himself, although it is explained that there is a lack of pedestrian traffic information on a national scale. Numerous special studies have been made, however, and these are used to compile information concerning sidewalk capacities, pedestrian volumes, speeds, and accidents.

In the chapter on traffic accident records and indices, the standard traffic accident reporting system developed by the National Safety Council and adopted by the National Conference on Uniform Traffic Accident Records is illustrated. Ways of expressing accident statistics in terms of exposure are explained, and methods for compiling death and accident rates, for comparing accidents and determining accident trends, and for estimating costs of accidents are described. The chapter also explains how to make and interpret collision and condition diagrams.

Vehicular volumes, speed studies, speed timing methods, and methods of making studies of types and volume of traffic, of pedestrian use of intersections and sidewalks, and of parking are covered in the chapter on Traffic Surveys and Studies.

The chapter on Pavement Markings includes the National Bureau of Standards' specifications for white and for yellow traffic paint, as well as analysis of where and how pavement markings can best be placed.

Design and size of traffic signs, as well as materials for use in signs, and studies of distances and heights for mounting signs are discussed in Chapter 8.

Uses American Standard on Signals

Traffic signal warrants, types of signals, their operation, timing and special signal uses, as well as layout of equipment, circuit systems and installation features are presented in the chapter on traffic signals. A great part of the material on fixed-time signals in this chapter is taken from the American Standard Manual on Uniform Traffic Control Devices as approved by the American Standards Association.

Street space required for various types of curb parking as well as parking along rural highways is discussed in detail in Chapter 10. Charts and diagrams show parking angles and space required for parking and for maneuvering, in parking lots as well as on the streets.

A discussion of one-way and through streets, of roadway design, including charts showing seeing distances, and lengths of acceleration and deceleration lanes is also included.

Both the National Safety Council method and

the American Automobile Association method of computing maximum safe speeds are given in the chapter on Speed Restrictions, as well as a graph showing the method for use in computing critical speeds of the American Association of State Highway Officials.

Traffic islands and loading zones, street and highway lighting (referring to the Illuminating Engineering Society's recommended practice for street lighting), and automobile headlighting are considered.

Two appendices give the entire text of the Institute of Traffic Engineers' standard for adjustable face traffic control signal heads and of the tentative standard for pre-timed, fixed cycle traffic signal controllers.

The co-authors of the handbook, Harold F. Hammond, director of the Traffic Division, National Conservation Bureau, and Leslie J. Sorenson, City Traffic Engineer, Bureau of Streets, Chicago, enlisted the aid of 14 nationally known traffic engineers in the actual writing of the book and of 34 others in reviewing the text before publication.

The Traffic Engineering Handbook may be ordered from the Institute of Traffic Engineers, or the National Conservation Bureau, both at 60 John Street, New York, at $3.25 per copy.

War Production Develops New Mass-Production Tools

ALREADY the demands of war production have brought about mighty new tools capable of performing the tasks of an entire production line at unprecedented speeds. Although these giants of production are called "Special" machine tools, their operation is based on the principle of standardization.

The Wright Aeronautical Corporation offers one outstanding example of the way in which high-production machines have replaced "standard" turret lathes, drills, milling machines, and the like.

Large orders for a single type of engine made it possible for the company to plan its production on a "straight" production line basis, in a new factory built especially for the purpose. Starting at one end of the building where rough stock is received, the parts progress steadily forward until they reach the barrier formed by the final inspection benches, over which they must pass before reaching the assembly floor, which is itself laid out for progressive assembly.

The equipment used is based on a study of methods and machines used in the automobile industry. In most cases it was found that the special machines would cost less than the large number of standard machines that would be required to perform the same work. Another important factor was reduction of floor space.

"Mechanical Engineering" Tells Story

The story of the change-over of the company's production from small lots rarely topping more than 50 engines at a time, in 1939, to the present mass-production methods, including a description of one of the interesting pieces of equipment used, was told by H. E. Linsley in a paper presented at the Annual Meeting of the American Society of Mechanical Engineers in December, 1941. The paper is published in full in *Mechanical Engineering*, February, 1942. The Greenlee automatic transfer machine for the machining of cylinder heads, which Mr. Linsley describes, might be considered as a series of individual, multiple-spindle machine tools arranged along both sides of an automatic conveyor and actually in itself a production line, he declares.

Copies of *Mechanical Engineering*, February, containing Mr. Linsley's article, may be ordered from the American Society of Mechanical Engineers, 29 West 39 Street, New York, at 60 cents.

Lions Clubs Encourage Use Of School Lighting Standard

"Lions Clubs spend much time, energy, and money in making their communities better places in which to live. Their programs include work undertaken by their sight conservation committees. Among the activities suggested for these committees we include better lighting in schools, homes, etc. The American Recommended Practice of School Lighting will give to these committees, especially those interested in school lighting, just the information they need as basic material and suggested procedure."

—Guy A. Edgar, Assistant Secretary, Lions International.

10,000 Women Are Measured For Study on Garment Sizes

CARRYING forward its studies of body measurements, which formed the basis last year of an American Standard Body Sizes for Boys' Garments, the U. S. Bureau of Home Economics, in cooperation with the WPA, has just issued a report of measurements taken on 10,042 women. As a result of these measurements the Bureau includes statistics to show that a combination of stature and weight would be most satisfactory in classifying women's body types as a basis for setting up a standard system of garment sizes.

The research project was undertaken in order to provide measurements which may be used to improve the fit of women's garments and garment patterns. No scientific study of body measurements used in the construction of women's garments and patterns has ever before been reported, Miss Ruth O'Brien, in charge of the project, declares. The measurements now used have grown up in the industry, chiefly by trial and error. As a result, there are no standards for garment sizes, and retailers and consumers are subjected to unnecessary expense and harassed by the difficulties involved in obtaining properly fitting clothing.

Size Designations Vary

The need for the project is evident from the fact that women's garments labeled the same size but made by different manufacturers vary greatly, and few of them fit without alteration. In some cases, alterations may amount to as much as an additional 25 per cent on the cost of the dress.

The study, as carried out by the Bureau, included not only the measuring of a large group of women, but also a detailed statistical analysis of the results. This analysis was planned to provide data from which the garment and pattern industry can develop a system of sizes satisfactory to consumers and all branches of the trade, Miss O'Brien explains.

As in the case of children's measurements, the analysis of women's measurements showed that girth dimensions of the body have little relation to vertical (height) measurements. For example, women with bust measurements of 46 or 47 inches are no taller, on the average, than those with bust 32. It was discovered, the report indicates, that no one girth measurement is as good for use in predicting other girths as is weight, since women with the same girth of bust frequently differ as much as 5 or 6 inches in hip girth. Height, however, seems to be as accurate for use in predicting other vertical measurements as any other vertical measurement, Miss O'Brien found. A stature-weight combination, in other words, would be the best basis for classifying women's body types.

Three Steps in Developing Standard

Three steps are involved in setting up a standard system of garment and pattern sizes: (1) Construction of a standard set of forms or manequins sized to represent the body measurements of women in the United States; (2) determination of necessary garment tolerances to allow for underclothing, comfort, and style, so as to translate the measurements of the mannequins into dimensions for finished garments; (3) establishment of a standard measuring procedure and method of designating the standard sizes so that each woman can be identified with the manequin resembling her. Figures for designing a set of manequins, based on stature and weight as the determining measurements, are included in Table 18 of the report. Data for alternative systems which would not, the report explains, be so generally satisfactory are also included, however.

The women measured were white residents and visitors in Arkansas, California, Illinois, Maryland, New Jersey, North Carolina, Pennsylvania, and the District of Columbia. They were 18 years of age, and older, and included both native and foreign-born.

The measurements, and the procedures followed in taking each measurement, were determined after conferences with leading pattern and garment manufacturers and retail distributors of women's clothing. They included weight, and 58 body measurements. Of these, 54 were taken with the woman wearing only the measuring costume. The complete list of measurements included those used in constructing all garments except shoes, hats, and gloves.

Are Few "Average" Women

Although the measurements indicate that the average woman has a stature of a little over 5 feet 3 inches, and a mean weight of 133½ pounds, the statistics definitely indicate that the

nation's women vary far too much in size to be properly fitted by garments made for the average woman, the report declares. They also show a surprising change in relationships between statures and girths with age. The women included in the study were of all ages, from 18 to more than 80. One of the tables in the report shows the means of seven different heights, six girths, and weight for women in different age groups. This table indicates that weight rapidly increases by more than 25 pounds up to 50- to 54-year age group and then declines. The girth measurements show the same tendency as weight but to varying degrees. As a matter of fact, the table of general averages shows nearly 20 pounds difference in weight between girls of 15, 16 and 17 and women over 18, more than 2½ inches in bust and hip girth, and more than 3½ inches in waist girth. Women over 18 vary among themselves, however, almost 2½ times as much as do girls of 15 to 17 years.

The report, which was prepared by Ruth O'Brien, chief of the Textiles and Clothing Division of the Bureau of Home Economics, and William C. Shelton, associate statistician, has been published as Miscellaneous Publication No. 454 of the United States Department of Agriculture. It was prepared in cooperation with the Work Projects Administration. It is entitled *Women's Measurements for Garment and Pattern Construction*, and is for sale by the Superintendent of Documents, Washington, D. C., at 40 cents.

British Show Progress On Standard Garment Sizes

A LONG-RANGE program for standardization of garment sizes and of household textiles took a step forward in Great Britain in 1941 with publication by the Retail Trading-Standards Association of a survey of British and American practice in sizing of garments.[1]

The survey describes the work done by a WPA project under the direction of the U. S. Bureau of Home Economics when some 147,000 children between the ages of 4 and 17 were measured.[2] A similar measurement project carried out by the British Association on a small number of children but following the procedure of the U. S. Bureau of Home Economics indicated that the measurements of British children are similar to those reported for American children. The principles established by the Bureau of Home Economics' measuring project were found to hold true in the British project—that no one measurement is an adequate index to size; that there is no dependable correlation between age and body dimensions; and that the best combination of indices is height and girth of hips.

One of the arguments advanced for standard garment sizes in Great Britain, particularly in women's wear, was the fact that "large and increasing numbers of ready-made dresses were being imported from the United States into this country prior to the war. Among the reasons for this appeared to be that the sizes of American garments were much more satisfactory than English sizes and more popular among consumers."

Wants Foreign Markets

Although the problem of competing with imported dresses does not arise at the moment, the Association points out, "if there is to be any hope of developing our export trade in women's garments it appears that a size system at least comparable with that of the United States should be available to British industry. To attempt to obtain foreign markets when there is no recognized system of sizes for the garments offered is to work under a great and unnecessary handicap. In this connection it might be mentioned that a number of South American markets now specify in their contracts that goods should comply with British Standards. To achieve this for women's dress sizes would be a tremendous fillip for the trade."

As illustrations of standard sizes for garments, Commercial Standards promulgated by the National Bureau of Standards and Federal Specifications issued for purchasing by the U. S. Government are cited in the report.

Recommendations of the Retail Trading-Standards Association made as a result of the report are that the British Standards Institution set up representative subcommittees to prepare standard sizes for children's, women's, and men's garments, as well as for household textiles.

[1] Preliminary Report on Standardization of Sizes of Garments and Household Textiles (prepared for the BSI by the Retail Trading-Standards Association), published by the British Standards Institution (C.4 (DS) 7637).

[2] The measurements compiled by this project were used as the basis for the work of the ASA Committee on Standardization of Children's Garment Sizes in preparing the American Standard, Body Sizes for Boys' Garments (L11.1-1941).

WPB Orders Include References to Standards

AMONG the orders issued recently by the War Production Board, several refer to standards or standardization, include required specifications, or require compliance with existing specifications. Some of these orders, received recently by the American Standards Association, are:

Rubber Products and Materials of which Rubber is a Component (WPB Supplementary Order No. M-15-b-1 to Restrict the Use of Rubber)

This Order includes specifications for certain types of hose in which reclaimed rubber is used; specifications for the manufacture of conveyor, elevator, and flat transmission belts and belting (restricting production to Grades A and B only); occupational protective clothing (other than footwear and gloves) and rubberized fabric for firemen's and policemen's clothing; jar rings; plain oxfords and laced-to-toe gym bals; water-proof boots, pacs, arctics, gaiters, and overshoes; tire casings and solid tires; and fire hose and mill hose. These latter specifications, it is explained, are identical with Federal Emergency Alternate Specifications E-ZZ-H-451a.

Metal Valves (Schedule I to Limitation Order No. L-42, Iron Body and Brass or Bronze Valves—Simplification).

This Order provides that no brass or bronze valves within the range of the steam pressure ratings below shall be produced or delivered unless they conform to the following standards:

Bronze or Brass Valves (Steam rated gate, globe, angle, and check valves)*

	Working Saturated Steam Pressure Pounds per sq in.
1/8 to 3 in. inclusive	100
	125
	150
	200
	300

Iron Body Valves (Steam rated gate, globe, angle, and check valves)*

Inches	*Pounds per sq in.*
3 to 12 inclusive	125
3 and smaller	150
2 to 12, inclusive	250

*These valves are designated as steam rated in order to identify their working pressure. This designation does not limit their use to steam service.

"The order, L-42," the War Production Board announces, "will be followed by a series of amendments requiring simplification of many other items manufactured by the plumbing and heating industry. Manufacturing specifications for these products were worked out by the Plumbing and Heating Branch after long study with industry representatives and with the Bureau of Standards and other interested government agencies."

The order declares that the "Director of Industry Operations may from time to time issue Schedules establishing simplified practices with respect to the types, sizes, forms, specifications, or other qualifications for any plumbing or heating products, or other similar products which may be used in any other line."

Iron and Steel Production, Maintenance, Repair, and Supplies (Amendment No. 2 and Extension No. 1 of Preference Rating Order P-68)

"(i) *Conservation and Standardization.* Every person affected by this Order shall use his best efforts to effectuate conservation of materials by elimination, simplification or standardization of types, sizes, or forms or otherwise, and shall cooperate in any program developed for such purpose by the War Production Board. The Director of Industry Operations may from time to time issue specific directions as to conservation, elimination, and standardization."

The order is for the purpose of facilitating the acquisition of material for operating supplies and for the maintenance and repair of property and equipment used in the production of iron, steel, blast furnace coke, ferroalloys, and detinned iron and steel scrap.

Cotton Textile Fabrics for Use as Agricultural Bags (General Preference Order No. M-107)

Defines "cotton textile fabrics suitable for agricultural bags" by giving constructions for Osnaburg, sheetings, and print cloth.

Recommend Practice For Inspection of Gears

A tentative recommended practice on inspection and tolerances for gears is being promulgated by the American Gear Manufacturers Association. The practice is expected to form a practical basis upon which gears can be manufactured, inspected, sold, or purchased.

Use of Benzol Is Safeguarded By American Standard Recommendations

REQUIREMENTS of New England and Middle Atlantic states controlling the use of benzol in industry follow closely the recommendations of the American Standard Allowable Concentration of Benzol a statement made recently by the New York State Department of Labor declares. The American Standard recommends that the maximum allowable concentration should be 100 parts of benzol per million parts of air.

The statement was issued by the Department following several newspaper articles which seemed to indicate that the use of benzol is prohibited in New York State. The use of benzol is not prohibited, the statement declares, but is safeguarded by the general requirements applicable to all potentially toxic substances.

"That benzol is a toxic substance is recognized by most if not all the authorities in the field of industrial hygiene," Industrial Commissioner Frieda S. Miller declared in the statement of the New York State Department of Labor. "Its use has produced deaths among industrial workers. That such grave incidents should be prevented hardly needs to be restated. The use of benzol in industrial processes in which it is permitted to evaporate into the atmosphere requires the installation of carefully designed control equipment and the maintenance of this equipment by responsible persons so that at all times the concentration of benzol in the atmosphere is maintained at a point below its toxic level. Such maintenance must be of a very high order in most cases. Medical supervision is of great aid in determining the onset of symptomology in persons especially susceptible to the effects of the inhalation of low concentrations of benzol.

"There are no regulations in the States of New York, Massachusetts or New Jersey which forbid the use of benzol in industry. In New York State the use of this material is safeguarded by the general requirements applicable to all potentially toxic substances. The law calls for the maintenance of conditions which do not 'tend to injure the health of the worker.' In Massachusetts the only legal requirement is that benzol containers must be labeled. This latter State recommends a limit of 75 parts of benzol per million of air, but only in an advisory manner for guiding the users of this material. The New Jersey statutes require that workers be not exposed to concentrations in excess of 100 parts of benzol per million parts of air.

"The American Standards Association, through one of its committees of experts, has recently promulgated a maximum allowable concentration of 100 parts of benzol per million parts of air.

"It would appear that the legal requirements in the States of New York, New Jersey and Massachusetts agree very well with the American Standards Association requirements and one wonders why there need be any confusion in the minds of persons interested in this subject. Certainly the facts are exceedingly clear and simple.

"The use of toluol, and other solvents less toxic than benzol and as substitutes therefor, has found favor in industry because less extensive control measures may be used with such less toxic materials, thus decreasing the cost of control measures and the degree of vigilance in their use.

"The need for maximum industrial production hardly requires reiteration at this time. Maximum production depends upon the maintenance of a body of industrial workers physically fit to do more than the usual ordinary day's work."

NBS Lists Publications On Electrical Instruments

Information concerning publications dealing with design, testing, or performance of electrical measuring instruments and meters is given in Letter Circular LC672 issued recently by the National Bureau of Standards. The list includes standards as well as textbooks and technical papers.

The Letter Circular is available from the National Bureau of Standards, Washington, D. C.

May Relax Plumbing Standards For Defense Housing

A series of conferences has been held by the National Association of Master Plumbers of the United States, Inc, with representatives of the Housing Priorities Branch and the Conservation Branch of the Division of Purchases of WPB and representatives of the United Association of Journeymen Plumbers and Steamfitters to relax some existing plumbing code standards in defense housing construction.

New Foreign Standards Received by ASA Library

The following is a list of new and revised standards which have been received recently by the American Standards Association, and which are available to members for loan from the ASA Library. The Argentine standards are published in Spanish.

Argentina

Benzol IRAM 1016-P
Canos de Acero con Rosca y Cupla para Usos Generales IRAM 2502-P
Dibujo Tecnico: Letras y Numeros IRAM 4503-P
Dibujo Tecnico: Formato de Laminas IRAM 4504-P
Simbolos Graficos Electrotecnicos para Instalaciones de Alumbrado, Calefaccion y Fuerza Motriz (Secciones I, II y III) IRAM 2010-P

Australia

Bed Blankets for Hospitals and Kindred Institutions Commercial Standard No. 10, Part 1, Section 2
Cutlery, Spoons and Forks for Hospitals and Public Utility Catering Services Commercial Standard No. 10, Part 6, Section 2
Flexible Cords, Approval and Test Specifications (For Power and Lighting Purposes) C116-1941
Electric Motor-Operated Applicances, Approval and Test Specification (With Motors having Ratings not exceeding 1 hp) C115-1941
Electrical Equipment of Buildings, Structures and Premises (SAA Wiring Rules) Part II—Materials: Introduction CC1, Part II-1941: Supplementary Approval and Test Specifications C130 to C145-1941

Australia (Continued)

Standardization of Aircraft Materials and Components—Interchangeability of Standard Parts (A Report) December 1941

Canada

Alkali Sulphate Resisting Cement A72T-1942
Canadian Electrical Code, Part II—Construction and Test of:
Industrial Control Equipment for Use in Ordinary (Non-Hazardous) Locations 2nd ed C22.2—No. 14-1942
Receptacles, Plugs and Similar Wiring Devices 2nd ed C22.2—No. 42-1942

Great Britain

Aircraft Materials and Components: Machined Hexagonal Headed Bolts (Aluminum Alloy) A17; Machined Hexagonal Nuts (Aluminum Alloy) A18; "20" Carbon Steel (Suitable for Welding) 3S21; 20-Ton Steel Tubes (Suitable for Welding) 3T26
Aircraft Materials Specifications DTD Series
Aircraft Parts—Handbook of Standards of Society of British Aircraft Constructors, Ltd. 1800-1816, incl; 1856-1870, incl.
Steel Plates, Sections, Bars and Rivets for Locomotive Boilers, Locomotives, Carriages and Wagons BS 24, Part 6-1942

New Zealand

War Emergency Standard

Specifications for Raid Shelters (Domestic) NZSS/E2

Board Appoints Committee To Study ASA Development

A Special Committee "to appraise the work of the American Standards Association and to propose a program of development and financing" was authorized at the December 10, 1941, meeting of the ASA Board of Directors. Members of the Special Committee have now been appointed as follows:

R. E. Zimmerman, president of the American Standards Association, *Chairman*

S. Bruce Black, National Association of Mutual Casualty Companies

George S. Case, American Society of Mechanical Engineers

C. L. Collens, National Electrical Manufacturers Association

Howard Coonley, Manufacturers Standardization Society of the Valve and Fittings Industry

H. S. Osborne, ASA Telephone Group, and Chairman, ASA Standards Council

J. C. Parker, vice-president, Consolidated Edison Company, and until recently a member of the ASA Board of Directors and of the ASA Standards Council

Prefabricated Houses Authorized For Government War Workers

To relieve the serious housing situation in Washington, $18,900,000 has been allocated for construction of 4,500 emergency dwelling units for war workers, many of which will be prefabricated. They will be of the removable type which can either remain as permanent structures or be moved to other locations after the war.

The new homes, which will be rented at rates within reach of workers earning $2,000 or less, will be as attractive in appearance, as complete in equipment, and as durable and long-lived as those of permanent construction, explained Defense Housing Coordinator Palmer who announced the project. "Many of them will be prefabricated at points removed from Washington and assembled on the sites here," he explained. Some will be single houses, others twin dwellings, and some row houses. "They will meet all standards set up by the Federal Housing Administrator for its 25-year financing plan," Mr. Palmer declared.

Annual Report Shows Increase In Bureau of Standards' Activities

NEW quarters for the Division of Trade Standards and an increase of 222 members in its staff during 1941, in addition to new projects undertaken and accomplishments on projects already under way, were reported by the National Bureau of Standards in the Annual Report of the Secretary of Commerce for 1941. One of the important developments during the year was purchase of 12½ acres of additional land on which it is planned to build a new materials testing laboratory. In the meantime, a dwelling house on the property is to be used as the new quarters for the Division of Trade Standards. The increase in staff during the past year now brings the number of the Bureau's employees to 1,204.

Increases Testing for Government

A 10 per cent increase is reported in one of the important services offered by the Bureau—the testing of supplies (other than food and drugs) purchased by the Government, and the calibration of instruments and working standards for private individuals and firms. Many investigations and tests in connection with the development and use of purchasing specifications were also made by the Bureau.

The work of the regular departments is reported in some detail. These departments include electricity, heat and power, optics, chemistry, mechanics and sound, organic and fibrous materials, metallurgy, clay and silicate products, building materials and structures, simplified practices, codes and specifications, and commercial standards.

In addition to this regular work the Bureau is carrying on special activities. Although unsettled world conditions make it impossible to continue progress toward international adoption of the new units of electricity and light, the Bureau is continuing its determinations of the absolute values of the electrical units. It is expected that this program will soon be completed and the projects will then be laid aside until international negotiations can be resumed.

The Bureau has been active during the past year on several national conferences and committees, including the National Conference on Weights and Measures which last year endorsed proposed Federal legislation for food-package standardization and made several changes in its recommended specifications and tolerance for weighing and measuring devices. The Bureau has also taken an active part in the work of the Interdepartmental Screw Thread Committee which has issued a revised report providing more fully for the needs of the Federal Government and bringing the screw-thread standards into agreement with current industrial practice. A revised and enlarged edition of a publication on gage blanks prepared by the American Gage Design Committee has been issued as Commercial Standard CS8-41. It contains new standards for thread-setting plug gages, taper-thread ring gages, dial indicators, and master disks.

In addition, the Bureau is sponsor or co-sponsor of 27 projects carried out under the procedure of the American Standards Association, and has 162 representatives on 119 ASA technical committees. It holds the chairmanship of 12 of these committees, vice-chairmanship of two, and secretaryship of seven.

It is also represented on technical committees and subcommittees of the American Society for Testing Materials, and takes part in the activities of 125 additional technical and trade organizations.

Works on Confidential Projects

During the past year, the Department of Commerce reports, the National Bureau of Standards is engaged on many confidential projects for the Army, Navy, the National Advisory Committee for Aeronautics, and the National Defense Research Committee.

Copies of the report on the work of the National Bureau of Standards, reprinted from the Annual Report of the Secretary of Commerce, 1941, are available from the Government Printing Office, Washington, D. C.

An "E" pennant for outstanding services to the Navy was awarded to the National Bureau of Standards by the Secretary of the Navy on February 21. The "E" pennant, awarded each year for excellence in gunnery to the battleship which makes the highest record in marksmanship, is one of the most prized awards in the Navy.

ASTM Issues Latest Edition of Insulating Materials Standards

THE latest edition of the ASTM Standards on Electrical Insulating Materials, just issued, provides in their latest form as of December, 1941, some 58 specifications and tests issued by the American Society for Testing Materials in this field. This edition is enlarged by the addition of new specifications and tests and several reports and papers. Outstanding activities of ASTM Committee D-9 on Electrical Insulating Materials are covered in reports on punching quality of laminated phenolic sheet; a study of measurements of power factor and dielectric constant at ultra-high frequencies; a report on round-robin tests of power factor and dielectric constant for glass; and several discussions on the significance of tests on insulating materials, including dielectric strength.

ASA Approves Standards

Insulating varnishes, lacquers, and their products; test methods for molded materials; plates, tubes, and rods; mineral oils; ceramic products; solid filling and treating compounds; insulating paper; rubber products; textile materials; and glass products and woven tapes are some of the subjects covered. In addition, tests are included covering arc resistance, dielectric strength, power factor, and related properties and tests.

Of these standards, four have been approved by the American Standards Association on the recommendation of the ASA Committee on Electrical Insulating Materials (C59). These are:

- Testing Molded Materials Used for Electrical Insulation (C59.1-1940; ASTM D 48-39)
- Testing Electrical Insulating Oils (C59.2-1941; ASTM D 117-40)
- Test for Insulation Resistance of Electrical Insulating Materials (C59.3-1939; ASTM D 257-38)
- Testing Molding Powders Used in Manufacturing Molded Electrical Insulators (C59.10-1941; ASTM D 392-38)
- Methods of Test for Impact Resistance of Electrical Insulating Materials (C59.11-1941; ASTM D 256-38)

In addition, Committee C59 is now studying three other standards for possible submittal to the ASA:

- Testing Laminated Tubes Used in Electrical Insulation (D 348-39)
- Testing Laminated Round Rods Used in Electrical Insulation (D 349-39)
- Testing Shellac Used for Electrical Insulation (D411-40)

The new edition of the ASTM Standards on Electrical Insulating Materials includes for the first time a detailed index and also includes two tables of contents, one listing the standards in numeric sequence and the other by subject. The 1941 report of Committee D-9, with its recommendations on standards, is also given.

Copies of the 450-page publication can be obtained from the American Society for Testing Materials, 260 S. Broad Street, Philadelphia, at $2.25 per copy in heavy paper cover.

Standards Agency Proposed as Help In Efficient Government Buying

A standardization agency with authority to adopt standards and to prepare and enforce written specifications was one of the requirements proposed for inclusion in a purchasing law designed to set up a successful purchasing system for state, city, or county governments. The suggestion was made in a pamphlet published recently by the National Association of Purchasing Agents. The pamphlet, *Purchasing Laws for State, County, and City Governments*, was prepared by Russell Forbes, formerly Commissioner of Purchase for the City of New York.

The law should provide that the chief executive, the purchasing official, and the using agencies be represented as members of the standardization agency, Mr. Forbes suggests.

The pamphlet, which includes suggested model laws for each type of government, outlines seven essentials for purchasing legislation. These requirements include qualifications for the chief purchasing official, and the authority to be vested in him and in his agency.

The first edition of the pamphlet was published in 1931, and was the second of a series of three pamphlets published by the National Association of Purchasing Agents on the subject of centralized buying in government. The first pamphlet sets forth arguments for centralizing the purchases for governmental agencies; the third suggests proper purchasing procedure, organization of the purchasing department, etc.

Copies of the pamphlets may be obtained from the National Association of Purchasing Agents, 11 Park Place, New York.

Standards Issued by Associations and Government

(See "ASA Standards Activities", page 106, for new American Standards and progress on ASA projects)

For the information of ASA Members, the American Standards Association gives here a list of the standards received during the past month by the ASA Library for its classified files. With the increasing amount of material being received it has been decided to eliminate from the monthly list a few of those standards which may not be so important to ASA Members, such as Federal Specifications for foods. The list below therefore, includes only those standards which the American Standards Association believes will be of greatest interest to Members in connection with their war production.

The standards listed may be consulted by ASA Members at the ASA Library, or copies may be obtained from the organization issuing the standard. Addresses of these organizations are given for your convenience.

Associations and Technical Societies

American Iron and Steel Institute (350 Fifth Avenue, New York)

Steel Products Manual:
Hot Rolled Carbon-Steel Bars Section 8 Revised Jan 1942 25¢
Cold Finished Steel Bars and Shafting Section 9 Revised Feb 1942 25¢
Alloy Steels Section 10 Feb 1942 25¢
Hot-Rolled Carbon-Steel Wire Rods Section 15 Revised Jan 1942 25¢
Carbon-Steel Wire Section 16 Feb 1942 25¢
Flat Steel Wire Section 17 Feb 1942 25¢

American Petroleum Institute (Department of Accident Prevention) (50 West 50th Street, N. Y.)

API Accident-Prevention Manual on Safe Transportation of Petroleum Products by Tank Truck No. 11 March 1942 25¢

American Welding Society (33 West 39th Street, New York)

Code for Arc and Gas Welding in Building Construction (Tentative) 1941 (superseding ed of 1937) 50¢

Copper and Brass Research Association (420 Lexington Avenue, New York)

Flat Rolled Products: Weights of Circles, Use of Weight Tables: Weights of Brass and Copper Circles Data-13 to 39 March 1942

Copper and Brass Research Association (Continued)

Weights of Rods and Use of Weight Tables (Brass, Copper, Silicon Bronze) Data-40 to 44 March 1942

Weights of Wire Data-45 and 46 March 1942

Round Seamless Tubes, Tolerances for Tube-2 March 1942 (supersedes ed of Dec 1938)

Plain Extruded Rod and Bar and Hot Rolled Round Rod—Diameter Tolerances Rod-2 March 1942 (supersedes ed of Aug 1941)

Radio Manufacturers Association (Engineering Department) (P. O. Drawer 431, Emporium, Pa.)

RMA Handbook of Standards and Engineering Information—new or revised sheets: Temperature Sensitive Capacitors 421 Jan 1942; Shafts and Screws 402, FM Broadcast Transmission 702, Television Transmitters 906 Jan 1942, replacing previous issues

Society of Automotive Engineers (29 West 39th Street, New York)

Aeronautical Material Specifications (AMS Series)—17 new and 26 revised specifications, as of March 1, 1942

Underwriters' Laboratories, Inc. (161 Sixth Avenue, New York)

Standard for Rigid Steel Conduit 4th ed March 1942

United States Government

National Bureau of Standards (Washington, D.C.)

Commercial Standards

List of Commercial Standards Letter Circular LC-676 Supersedes LC-669

Automatic Mechanical Draft Oil Burners Designed for Domestic Installations (Second Edition) Mimeographed CS75-42

Flue Connected Oil Burning Space Heaters Equipped with Vaporizing Pot Type Burners Mimeographed CS101-43

Commercial Standards (Continued)

Multiple-Coated, Porcelain-Enameled Steel Utensils Mimeographed CS100-42

Simplified Practice Recommendations

Circulated to Industry

Containers and Packages for Shortening and Oils

Jersey Cloth for Work Gloves

Metal Partitions for Toilets and Showers Proposed emergency Supplement to SPR R101-40

Pipe, Ducts, Fittings, and Registers for Warm-Air Heating and Air Conditioning (Eliminates more than 4500 kinds and sizes of pipes, ducts, and fittings)

Range Boilers and Expansion Tanks Emergency Revision of SPR R8-29

Wrought-Iron and Wrought Pipe, Valves, and Fittings Revision of SPR R57

Approved by Industry and Effective on Date Shown

Bell-Bottom Screw Jacks (four-way-head type) R97-42 April 15, 1942

Unbleached Cotton Canton Flannel for Work Gloves R186-42 April 1, 1942

Waxed Paper, Moulded Wood Pulp and Wood Types of Food Trays R187-42 April 1, 1942

Reaffirmed Without Change

Steel Horizontal Firebox Heating Boilers R157-37

In Print (Copies Available from Superintendent of Documents, Washington, D. C.)

Forged Axes SPR R158-41 5¢

Metal Lath SPR R3-41 5¢

Paints, Varnishes, and Related Products (Colors, Shades, and Containers) SPR R144-42 5¢

Roofing Ternes SPR R30-42 5¢

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications

(Copies Available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

The date after the title of the specification indicates when it becomes effective.

Bearings
- ball (Amendment 1) FF-B-171 July 1, 1942
- roller (Amendment 1) FF-B-186 June 15, 1942

Binders; loose-leaf, ring-type (New) UU-B-346 June 15, 1942

Bits, Wood-Boring; and chisels, mortising, hollow (superseding GGG-A-801) GGG-B-383 May 15, 1942

Bleaching-Material (chlorinating agents) (Amendment 1) O-B-441a July 15, 1942

Borax (Sodium Borate) (Amendment 1) SS-B-611 June 15, 1942

Cabinets; filing, insulated, fire-resisting (New) AA-C-23 July 1, 1942

Drills; electric, portable (exclusive of high-frequency types) (New) W-D-661 June 15, 1942

Fuses; cartridge, enclosed, nonrenewable (superseding W-F-791) W-F-791a July 1, 1942

Commercial Standards (Continued)

Ink; drawing, waterproof, black (superseding TT-I-528) TT-I-528a July 1, 1942

Insulation;
- bat or strip-form and loose-fill (Amendment 2) HH-I-521b June 1, 1942
- (Glass Fiber); semirigid (New) HH-I-556 June 1, 1942

Iron and Steel; sheets, tinned (tin-plate) (superseding QQ-I-706) QQ-I-706a May 1, 1942

Machines, Food-Mixing; electrically operated, commercial type (cake and kitchen) (New) OO-M-38 June 15, 1942

Paper; wrapping, dispensary (New) UU-P-611 July 1, 1942

Safes; insulated (superseding AA-S-81) AA-S-81a June 1, 1942

Soap
- Borax-Compound; toilet (for) dispensers (New) P-S-628 July 1, 1942
- laundry, powdered (superseding P-S-596) P-S-596a July 15, 1942
- powder (superseding P-S-606) P-S-606a July 15, 1942
- toilet, powdered (for) dispensers (superseding P-S-626) P-S-626a July 15, 1942

Wrenches; pipe (Amendment 2) GGG-W-651a July 1, 1942

Emergency Alternate Federal Specifications

(Prepared in collaboration with the War Production Board)

Baskets, Desk; steel (strip and wire) E-RR-B-131 Feb 27, 1942

Boxes
- Fiber, corrugated (superseding E-LLL-B-631A Jan 24, 1942) E-LLL-B-631A March 19, 1942
- and Outlet Fittings, Floor; (for) rigid-steel-conduit and electric-metallic-tubing (steel) (superseding E-W-B-616, May 23, 1941) E-W-B-616 Feb 27, 1942

Brushes
- Calcimine E-H-B-141 March 19, 1942
- dust; radiator E-H-B-221 Feb. 27, 1942
- paint, metal-bound, flat (high-grade) E-H-B-421; (medium-grade) E-H-B-431; (utility-wall) E-H-B-436 March 6, 1942
- radiator, bronzing E-H-B-451 Feb 27, 1942
- scrubbing
  - deck (superseding E-H-B-531, Dec 16, 1941) E-H-B-531 March 6, 1942
  - floor, hand E-H-B-541 March 19, 1942
- stencil (flag ends preserved) E-H-B-626 Feb 27, 1942
- typewriter E-H-B-681 March 19, 1942
- varnish
  - flat (double X thickness) E-H-B-701; (triple X thickness) E-H-B-[illegible]5, March 6, 1942; E-H-B-696 March 19, 1942
  - oval E-H-B-711 March 19, 1942

Chrome, Green
- oxide E-TT-C-231 Feb 24, 1942
- pure, dry, paste-in-Japan, paste-in-oil E-TT-C-236 Feb 24, 1942

Chrome Yellow and Chrome-Orange; dry, paste-in-Japan, and paste-in-oil E-TT-C-236

Emergency Alternate Federal Specifications (Continued)

Clips; paper, wire (superseding E-FF-C-436 Jan 24, 1942) E-FF-F-101 March 6, 1942

Enamel, water-resisting, red E-TT-E-531a Feb 24, 1942

Fans, electric; bracket-type, rigid-blades (for shore use) E-W-F-101a March 9, 1942

Fasteners; paper, brass (superseding E-FF-F-101, Jan 24, 1942) E-FF-F-101 March 6, 1942

Fencing; chain-link or welded (superseding E-RR-F-191, June 2, 1941) E-RR-F-191 March 19, 1942

Fittings; cable and conduit (superseding E-W-F-406, May 23, 1941) E-W-F-406 Feb 27, 1942

Hose, Fire; cotton, rubber-lined (superseding E-ZZ-H-451a Jan 30, 1942) E-ZZ-H-451a Feb 24, 1942

Machines

- chopping (grinding), meat E-OO-M-18 March 9, 1942
- floor-polishing and scrubbing; electric (superseding EW-M-46a, Jan 30, 1942) E-W-M-46a March 19, 1942
- meat-and-vegetable cutting; electrically operated E-OO-M-52 March 9, 1942
- slicing, bread E-OO-M-66; meat (superseding E-OO-M-81 Dec 20, 1941) E-OO-M-81 March 9, 1942

Matches; safety (full-size in boxes) E-EE-M-101b Feb 26, 1942

Mops; cotton E-T-M-561a March 6, 1942

Outlet-bodies; iron (cast or malleable), cadmium or zinc-coated with covers and accessories (for shore use) (superseding E-W-O-806, May 23, 1941) E-W-O-806 Feb 27, 1942

Outlet-boxes; steel, cadmium or zinc-coated, with covers and accessories (superseding E-W-O-821a, May 23, 1942) E-W-O-821a Feb 27, 1942

Pads; desk E-UU-P-16 Feb 27, 1942

Paint

- graphite, outside, ready-mixed, black E-TT-P-27 Feb 24, 1942
- lead-zinc-base, ready-mixed, and semipaste, white and tinted E-TT-P-36a Feb 24, 1942
- outside, ready-mixed, medium-chrome-yellow E-TT-P-53 Feb 24, 1942
- ready-mixed, international orange E-TT-P-59 Feb 24, 1942
- ready-mixed and semipaste, exterior chrome-green E-TT-P-71a Feb 24, 1942
- red-lead-base; linseed oil, ready-mixed E-TT-P-86 Feb 24, 1942
- titanium-zinc and titanium-zinc-lead, outside, ready-mixed, white E-TT-P-101a Feb 24, 1942
- white-lead-base; basic-carbonate, ready-mixed, light-tints and white E-TT-P-156 Feb 24, 1942

Emergency Alternate Federal Specifications (Continued)

Panelboards

- equipped with automatic circuit-breakers E-W-P-131a Feb. 27, 1942
- equipped with fuse connections, or switches and fuse connections (superseding E-W-P-146, May 23, 1941) Feb 27, 1942

Paper

- Kraft, wrapping E-UU-P-268a Feb 16, 1942
- teletype, roll and tape E-UU-P-547b Feb 24, 1942

Paste, Office; paste-brushes and spreaders E-N-P-101b Feb 27, 1942

Pencils; mechanical; leads, and erasers E-SS-P-186 Feb 27, 1942

Perforators; paper, desk E-GG-P-191a Feb 27, 1942

Pins

- cotter, split E-FF-P-386 Feb 24, 1942
- office (superseding E-FF-P-401a, Jan 24, 1942) E-FF-P-401a March 6, 1942

Rope; wire (superseding E-RR-R-571, Jan, 1942) E-RR-R-571 March 9, 1942

Tags; shipping and stock E-UU-T-81b March 6, 1942

U. S. Army and Navy

List of Materials and Process Specifications for use in the maintenance and construction of aircraft (Lists Air Corps, Army-Navy Aeronautical, U.S. Army, and Federal Specifications) May be obtained for use in connection with Air Corps contracts and for bidding purposes upon request to the Assistant Chief, Materiel Division, Wright Field, Dayton, Ohio. Bulletin No. 23, March 10, 1942.

Index of Bureau of Ships (Ad Interim) (INT) Specifications Part I, Numerically; Part II, Alphabetically (Corrected to and including 15 January, 1942) One copy in ASA Library for reference only.

Monthly Report on Changes in U.S. Army Specifications, Federal Specifications, Commercial Standards, Simplified Practice Recommendations compiled by the Standards Division, Resources Branch, Office of the Under Secretary of War, February, 1942.

Army Specifications for the use of the Medical Corps, including thermometers, prostatic tractors, surgical and dental scissors, cranial drills, surgical knives, etc.

U. S. Department of Agriculture, Agricultural Marketing Service (Washington, D.C.)

Carrots with short-trimmed tops (U.S. Standards)

Grades of canned peas (U.S. Standards)

Processed raisins (tentative U.S. Standards)

Strawberries (U.S. Standards)

ASA Drops Project On Printing Sprays

A request for a new project to develop specifications for the spray solutions used in printing presses to prevent offset, which was submitted last year to the American Standards Association by the New York Employing Printers Association, has brought about the organization of a new association and a testing and labeling program for non-offset printing sprays to protect workers.

As a result of the new set-up, the New York Employing Printers Association has requested the ASA to drop the proposed project on printing sprays, which it had asked the ASA to initiate.

Studies carried out by the organizations concerned as a result of the request for the ASA

project brought a decision that research is needed to determine what toxic substances are present in the various solutions on the market. A new organization called the Graphic Arts Spray Manufacturers was set up and arrangements have been made that manufacturers of spray mixtures can submit their products for test through the new organization. If it is found that a commercial spray solution contains no harmful ingredients, its manufacturer will be given permission to use a special label showing that the spray is approved by the Graphic Arts Spray Manufacturers.

Standards for Chairs First In School Furniture Program

Specifications for folding chairs have been prepared as the first result of an investigation to determine minimum requirements for school furniture carried out under the sponsorship of the American Council on Education through a research associateship at the National Bureau of Standards. Ninety-two chairs, submitted by 18 manufacturers, were tested in the Bureau's study.

The specifications prepared as the result of the research program are written in terms of use factors, leaving to the manufacturer the methods for meeting these use requirements. They set minimum standards, and, in general, contain no description of sizes or shapes of structural parts or other details of construction. The exceptions are when the shape or design of the part directly affects the use of the chair, or where manufacturing procedure is standardized and performance tests would be highly complicated and expensive.

The chairs were measured for compliance with principles of safety, comfort, and posture, and tested for strength and durability. Before they were made a part of the specifications, the results of the measurements and tests were compared with experience in schools.

ASA Standards Activities

Standards Available Since Our March Issue

Cast-Iron Screwed Drainage Fittings American Standard B16.12-1942 45¢

Dry Cells and Batteries, Specifications for (Revision of C18-1937) American Standard C18-1941 10¢

Illuminating Engineering Nomenclature and Photometric Standards (Revision of Z7-1932) American Standard Z7.1-1942 25¢

Rubber Gloves for Electrical Workers (ASTM D120-40) American Standard C59.12-1942 25¢

Standards Approved Since Our March Issue

Acoustical Measurements and Terminology

- Acoustical Terminology (Revision of Z24.1-1936) American Standard Z24.1-1942
- Noise Measurement (Revision of Z24.2-1936) American Standard Z24.2-1942

Copper

- Hot-Rolled Copper Rods for Electrical Purposes (ASTM B49-39) (Revision of H4.7-1940) American Standard H4.7-1942
- Soft or Annealed Copper Wire (ASTM B3-39) (Revision of H4.1-1940) American Standard H4.1-1942

Gas Appliance Connectors of Flexible Metal Tubing and Fittings, Listing Requirements American Standard Z21.32-1942

Industrial Lighting American Recommended Practice A11-1942 (Revision of A11-1930)

Rubber Gloves for Electrical Workers (ASTM D120-40) American Standard C59.12-1942

Standards Being Considered by ASA for Approval

Adjustable Face Traffic Control Signal Head Standards

Cast Iron

- Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)
- Cast-Iron Culvert Pipe (ASTM A142-38) G26
- Gray-Iron Castings (ASTM A48-41) G25
- Lightweight and Thin-Sectioned Gray-Iron Castings (ASTM A190-40) G27

Elevators, Dumbwaiters and Escalators, Safety Code (Supplement to 1937 ed—A17.1-1937)

Explosives in Anthracite Mines, Use of M27

Jacks, Safety Code B30

Keyways for Holes in Gears B6.4

Lime

- Limestone, Quicklime, and Hydrated Lime, Methods of Chemical Analysis of (ASTM C25-29)
- Quicklime for Structural Purposes, Specifications for (ASTM C5-26)

Manufactured Masonry Units

- Brick (Modulus of Rupture, Compressive Strength, Absorption, Freezing, and Thawing), Methods of Testing (ASTM C67-41) A82
- Concrete Building Brick (ASTM C55-37) A75
- Concrete Masonry Units (ASTM C140-39) A84
- Hollow Load-Bearing Concrete Masonry Units (ASTM C90-39) A79
- Hollow Non-Load-Bearing Concrete Masonry Units (ASTM C129-39) A80

Standards Being Considered (Continued)

Sand-Lime Building Brick (ASTM C73-39) A78

Solid Load-Bearing Concrete Masonry Units (ASTM C145-40) A81

Structural Clay Floor Tile (ASTM C57-39) A77

Structural Clay Load-Bearing Wall Tile (ASTM C34-41) A74

Structural Clay Non-Load-Bearing Tile (ASTM C56-41) A76

Structural Clay Tile, Methods of Testing (ASTM C112-36) A83

Materials for: Boilers, Pressure Vessels, etc.: Flanges and Boltings: Locomotives

Boiler Rivet Steel and Rivets (ASTM A31-40) G28

Carbon-Silicon Steel Plates of Ordinary Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels (ASTM A201-39) G31

Carbon-Steel Plates for Stationary Boilers and Other Pressure Vessels (ASTM A70-39) G29

Chrome-Manganese-Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels (ASTM A202-39) G32

High-Tensile Strength Carbon-Silicon Steel Plates for Boilers and Other Pressure Vessels (Plates 4½ In. and Under in Thickness) (ASTM A212-39) G35

Low-Carbon Nickel-Steel Plates for Boilers and Other Pressure Vessels (ASTM A204-39) G33

Low Tensile Strength Carbon-Steel Plates of Flange and Firebox Qualities (ASTM A89-39) G30

Molybdenum-Steel Plates for Boilers and Other Pressure Vessels (ASTM A204-39) G34

Alloy-Steel Castings for Valves, Flanges, and Fittings for Service at Temperatures from 750 to 1100 F (ASTM A157-41) G36

Carbon and Alloy-Steel Nuts for Bolts for High-Pressure and High-Temperature Service to 1100 F (ASTM A194-40) G38

Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves for Parts for Service at Temperatures from 750 to 1100 F (ASTM A182-40) G37

Structural Steel for Locomotives and Cars (ASTM A113-39) G39

Protection of Structures Containing Inflammable Liquids and Gases—Part 3 of Code for Protection Against Lightning (From status as American Tentative Standard to American Standard) C5, Part 3

Public Approval and Certification Procedures Z34

Refrigerators Using Gas Fuel, Approval Requirements for

Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric and Oil-Electric Coaches (Revision of C35-1936) C35

Standard Machine-Tool Gray "7 B"

Structural Steel and Concrete Reinforcement

Axle-Steel Bars for Concrete Reinforcement (ASTM A160-39) G43

Fabricated Steel Bar or Rod Mats for Concrete Reinforcement (ASTM A184-37) G44

High-Strength Structural Rivet Steel (ASTM A195-41) G42

Low Tensile Strength Carbon-Steel Plates of Structural Quality for Welding (ASTM A78-40) G40

Structural Silicon Steel (ASTM A94-39) G41

Welded Steel Wire Fabric for Concrete Reinforcement (ASTM A185-37) G45

Structural Steel, Building Code Requirements

Standards Being Considered (Continued)

Textile Testing Machines (ASTM D76-41)

Wool Felt, Methods of Testing (ASTM D461-40)

Standards Submitted for Consideration Since Our March Issue

Identification Markings of Compressed Gas Cylinders, Proposed Standardization

Gas Floor Furnaces (CS99-42)

Lap-Welded and Seamless Steel Pipe for High-Temperature Service (ASTM A106-40) (Revision of B36.3-1940)

Standards Withdrawn by ASA

Portland Cement—Specifications A1a-1931

Cement, Methods of Testing A1.2-1933

Project Withdrawn by ASA

Non-Offset Spray Solutions—Proposed Specifications

New Project Being Considered

Performance of commercial dishwashing machines, and practice for dishwashing operation

Defense Emergency Standards

Standards Approved and Published

Accuracy of Engine Lathes B5.16-1941

Allowable Concentration of Cadmium Z37.5-1941

Guide for Quality Control Z1.1-1941

Control Chart Method of Aanalyzing Data Z1.2-1941

Standards Approved Since Our March Issue

Domestic Gas Ranges, Approval Requirements Z21.1ES-1942

Photographic Exposure Computer Z38.2.2-1942

Standards Under Way

Allowable Concentration of Ether Z37

Allowable Concentration of Manganese Z37

Allowable Concentration of Xylol Z37

Color, Specification and Description

Color Fastness of Textiles, Terminology

Control Chart Method of Controlling Quality During Production Z1.3

Machine Tool Electrical Standards

Protective Lighting of Industrial Plants

Projects Withdrawn

Automatic Refrigerators B38

Domestic Washing Machines

Electric Flat-irons

Textile Definitions (Denim and Broadcloth)

Requests for Emergency Projects Being Considered

Gas Water Heaters

Graphical Symbols for Electric Power, Control and Measurement Z32.3

Graphical Symbols for Telephone, Telegraph, and Radio Use

Bolts, Nuts, Screws, and Other Threaded Parts

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